

A.

a) $\overline{A} \cdot \overline{B} \cdot \overline{C} + \overline{A} \cdot \overline{B} \cdot C + \overline{A} \cdot B \cdot C + A \cdot B \cdot \overline{C}$

000 001 011 110

	"0"	"1"	C
"00"	1	1	
"01"		1	
"11"	1		
"10"			
AB			

$$\overline{A} \cdot \overline{B} + \overline{A} \cdot C + A \cdot B \cdot \overline{C}$$

b) $A \cdot C \cdot [\overline{B} + B \cdot (B + \overline{C})]$

$$A \cdot C \cdot (\overline{B} + B \cdot B + B \cdot \overline{C}) \rightarrow A \cdot C \cdot \overline{B} + A \cdot C \cdot B + A \cdot C \cdot B \cdot \overline{C} \rightarrow A \cdot C \cdot \overline{B} + A \cdot C \cdot B$$

001 111

	"0"	"1"	C
"00"			
"01"			
"11"		1	
"10"		1	
AB			

$$A \cdot C$$

c) $D \cdot E \cdot \overline{F} + \overline{D} \cdot E \cdot \overline{F} + \overline{D} \cdot E \cdot F$

110 010 000

	"0"	"1"	F
"00"	1		
"01"	1		
"11"	1		
"10"			
DE			

$$\overline{D} \cdot \overline{F} + E \cdot \overline{F} \rightarrow \overline{F} \cdot (E + \overline{D})$$

B.

a) $A + B \cdot \overline{C} + C \cdot D$

1000 1001 1010 1011 1100 1101 1110 1111
 0100 0101 1100 1101
 0011 0111 1011 1111

	"00"	"01"	"11"	"10"	CD
"00"			1		
"01"	1	1	1		
"11"	1	1	1	1	
"10"	1	1	1	1	
AB					

$$B \cdot \overline{C} + C \cdot D + A$$

Sinplifikatuta dago!

b) $A + B \cdot C$

100 101 110 111
011 111

$A + B \cdot C$

Sinplifikatuta dago!

	"0"	"1"	C
"00"			
"01"		1	
"11"	1	1	
"10"	1	1	
AB			

c) $A \cdot \overline{B} \cdot \overline{C} \cdot D + A \cdot C \cdot \overline{D} + B \cdot \overline{C} \cdot D + \overline{A} \cdot B \cdot C \cdot \overline{D}$

1001
1010 1110
0101 1101
0110

	"00"	"01"	"11"	"10"	CD
"00"					
"01"		1		1	
"11"		1		1	
"10"		1		1	
AB					

$$B \cdot \overline{C} \cdot D + A \cdot \overline{C} \cdot D + B \cdot C \cdot \overline{D} + A \cdot C \cdot \overline{D} \rightarrow A \cdot C \cdot \overline{D} + A \cdot \overline{C} \cdot D + B \cdot C \cdot \overline{D} + B \cdot \overline{C} \cdot \overline{D}$$

d) $A \cdot \overline{B} + A \cdot \overline{B} \cdot \overline{C} \cdot D + CD + B \cdot \overline{C} \cdot D + A \cdot B \cdot C \cdot D$

1000 1001 1010 1011
~~1001~~
0011 0111 ~~1011~~ 1111
0101 1101
1111

	"00"	"01"	"11"	"10"	CD
"00"			1		
"01"		1	1		
"11"		1	1		
"10"	1	1	1	1	
AB					

$C \cdot D + B \cdot D + A \cdot \overline{B}$

C.

a	b	c	F
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	1

	"0"	"1"	C
"00"	1	1	
"01"		1	
"11"		1	
"10"	1	1	
AB			

000 001 011 100 101 111

$$C + \overline{B} \cdot \overline{C} \rightarrow C + \overline{B}$$

D.

a	a	b	d	F
0	0	0	0	0
0	0	0	1	1
0	0	1	0	1
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	1
0	1	1	1	1
1	0	0	0	1
1	0	0	1	0
1	0	1	0	x
1	0	1	1	x
1	1	0	0	x
1	1	0	1	x
1	1	1	0	x
1	1	1	1	x

	"00"	"01"	"11"	"10"	CD
"00"		1		1	
"01"			1	1	
"11"	1	1	1	1	
"10"	1		1	1	
AB					

$$\overline{A} \cdot \overline{B} \cdot \overline{C} \cdot D + C \cdot \overline{D} + B \cdot C + A \cdot C + A \cdot B + A \cdot \overline{C} \cdot \overline{D}$$

E.

a) $(A + \overline{B} + C + D) \cdot (\overline{A} + B + \overline{C} + D) \cdot (\overline{A} + \overline{B} + \overline{C} + \overline{D})$

0101 1010 1111

	"00"	"01"	"11"	"10"	CD
"00"					
"01"		0			
"11"			0		
"10"				0	
AB					

Sinplifikatuta dago!

b) $(X + \overline{Y}) \cdot (W + \overline{Z}) \cdot (\overline{X} + \overline{Y} + \overline{Z}) \cdot (W + X + Y + Z)$

0010 0011 1010 1011
 0001 0101 1001 1101
 0111 1111
 0000

	"00"	"01"	"11"	"10"	CD
"00"	0	0	0	0	
"01"		0	0		
"11"		0	0		
"10"		0	0	0	
AB					

$$\overline{D} \cdot (A + B) \cdot (\overline{A} + B + \overline{C})$$

F.

a	a	b	d	F
0	0	0	0	0
0	0	0	1	1
0	0	1	0	1
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	1
0	1	1	1	1
1	0	0	0	1
1	0	0	1	0
1	0	1	0	1
1	0	1	1	0
1	1	0	0	1
1	1	0	1	1
1	1	1	0	0
1	1	1	1	1

0000 0011 0100 0101 1001 1011 1110

	"00"	"01"	"11"	"10"	CD
"00"	0		0		
"01"	0	0			
"11"				0	
"10"		0	0		

AB

$$(A+C+D) \cdot (A+\overline{B}+C) \cdot (B+\overline{C}+\overline{D}) \cdot (\overline{A}+B+\overline{D}) \cdot (\overline{A}+\overline{B}+\overline{C}+D)$$

G.

01010 00011 10011 11000 01110 01101 00000 00111 11010 11011

E=0	"00"	"01"	"11"	"10"	CD
"00"	1				
"01"	1	1	1		
"11"	1	1			
"10"					

AB

E=1	"00"	"01"	"11"	"10"	CD
"00"		1	1		
"01"				1	
"11"		1			
"10"		1			

AB

$$\begin{aligned} &\overline{A} \cdot \overline{B} \cdot \overline{C} \cdot \overline{D} + A \cdot B \cdot \overline{C} + \overline{A} \cdot B \cdot D + \overline{A} \cdot \overline{B} \cdot D + \overline{A} \cdot B \cdot C \cdot \overline{D} + A \cdot \overline{C} \cdot D \\ &\overline{A} \cdot \overline{B} \cdot \overline{C} \cdot \overline{D} + A \cdot B \cdot \overline{C} + \overline{A} \cdot D \cdot (B + \overline{B}) + \overline{A} \cdot B \cdot C \cdot \overline{D} + A \cdot \overline{C} \cdot D \\ &\overline{A} \cdot \overline{B} \cdot \overline{C} \cdot \overline{D} + A \cdot B \cdot \overline{C} + \overline{A} \cdot B \cdot C \cdot \overline{D} + \overline{A} \cdot (D + \overline{C} \cdot D) \end{aligned}$$

$$\overline{A} \cdot \overline{B} \cdot \overline{C} \cdot \overline{D} + A \cdot B \cdot \overline{C} + \overline{A} \cdot B \cdot C \cdot \overline{D} + \overline{A} \cdot D$$